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EXPLORING THE ADVANCEMENTS IN MOOC STUDIES: A 2008-2022 OVERVIEW

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Abstract

MOOCs (Massive Open Online Courses), play a crucial role in advancing the development of global e-education. This form of education, delivered via the internet, aims to reach diverse learners worldwide, regardless of their reasons for learning, backgrounds, abilities, or limitations. However, currently, the accessibility of MOOC platforms and content still remains a challenge, as they are not adequately available to all students. to effectively understand the MOOC phenomenon, it is important to uncover and visualize the MOOC research trends and patterns. This paper presents a complete overview of MOOC research from 2008 to 2022, including several studies led in different years. The study also offers an all-about investigation of the MOOC system, its functions, and its components.

Keywords: MOOC; Massive Open Online Course; A Systematic Review; Online Course.

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Introduction

Recent developments in digital learning have made it feasible to abandon traditional lecture-based learning approaches in favor of more creative and effective teaching techniques. These approaches make students work together to learn and give many students open access to course content. Among these methods are MOOCs (Massive Open Online Courses), one of the methods of learning that has received a lot of attention. Their motto is "Education for All, Anywhere, Anytime." (Dalibey et al., 2021). MOOC is a new idea in the field of distance education. It is an idea of education accessible to all (Lin Cui et al., 2014). They are online courses with open enrollment in which tens of thousands of students are enrolled. MOOCs teach content through online readings (pdf, word, text), online exams, recorded video lectures, and face-to-face interactions between students and teachers (Tzeng et al., 2022). The first MOOC was offered by the University of Manitoba in 2008 and was titled "Connectivism and Connective Knowledge MOOC." However, the launch of MOOC platforms such as Coursera, edX, and Udacity in 2012 sparked a huge trend (Gamage et al., 2020). Because of the extremely large number of participants, each of them has a unique educational background and approach to studying., it is extremely challenging to create a course that matches the specific needs of each student. To combat this issue, MOOC platforms employ various personalization strategies. Personalized education enhances student appeasement and improves academic achievement (Kiselev & Yakutenko, 2020). Participants (or "students") in MOOC courses are joined by an instructor with the goal of facilitating their education. Internet access is typically supplied through social networking sites, while content or academic resources are typically provided through a collection of openly available online resources. As a bonus, there are rarely any restrictions on who may join or how active they must be to participate (Liyanagunawardena et al., 2013). There are activities or projects to test students' learning, quizzes and exams (typically multiple-choice questions), a syllabus with the course objectives and expected results, a calendar, some educational materials (mostly videos, but also lecture notes and assigned readings), and a forum for discussion with the instructor and other students.. However, MOOCs are not provided by a single institution, but rather by a wide range of providers (Pedro Pern´ıas Peco & Sergio Luj´an-Mora, 2013).

Two types of MOOCs have clear differences in how they teach:

xMOOCs (also known as "eXtended MOOCs") are a type of MOOC that is typically structured like a traditional classroom course. They are usually instructor-led and have a more structured and sequential format, with video lectures, interactive quizzes, and other forms of assessment. xMOOCs often focus on imparting knowledge and skills and are designed for individuals who want to learn at their own pace (Lourdes Guàrdia et al., 2013).

cMOOCs (also known as "connectivist MOOCs") are a type of MOOC that is designed to foster collaboration and connection among participants. They are typically more open-ended and student-driven and focus on developing skills such as critical thinking, problem-solving, and collaboration. cMOOCs often use a variety of online tools and resources to facilitate learning, including discussion forums, blogs, wikis, and social media (Yoila, 2015).

Both xMOOCs and cMOOCs have their own unique strengths and weaknesses, and they are used in different ways to achieve different learning outcomes. While xMOOCs may be better suited for delivering structured, content-based education, cMOOCs may be better suited for fostering a community of learners who can engage in collaborative learning and knowledge-building. Table (1) summarizes the differences between cMOOCs and xMOOCs.

Table (1) Comparisons between cMOOCs and xMOOCs

cMOOCs	Dimension	xMOOCs
Connectivism	Learning theory	Behaviorism
Knowledge construction	Teaching approach	Knowledge duplication
Coordinator of curricular activities	Role of teachers	Dominant curricular activities
Learner-centred	Learning approach	Teacher-centered
Contributors of knowledge	Role of learners	Recipients of knowledge
Long	Duration	Cohort-based, fixed
Relative equality	Teacher and student relations	Relative inequality
Multi-way (between students and teachers)	Means of knowledge transmission	One-way (teachers to students)
Social media software	Carriers of curricular materials	Learning management system

RESEARCH OBJECTIVES

Everyone who wants to understand what a MOOC is should read this paper because it is both clear and thorough.

METHODOLOGY

A systematic literature review is a procedure that is organized, exhaustive, and reproducible. Using these definitions, this study's primary objective was to: Conduct a thorough analysis of all previously published MOOC reviews as well as perform another analysis of the MOOC system, its operation, and its components.

Literature review

MOOC Reviews

Over the years, different sorts of reviews, including critical and systematic reviews, have been conducted on MOOCs.

♦The first extensive examination of MOOCs was published in 2013 by researchers (Liyanagunawardena et al., 2013). Their study analyzed a specific and limited aspect of the data and studies surrounding MOOCs from 2008 to 2012. However, there are still numerous intriguing research areas that have yet to be explored, such as cultural tensions within courses and the ethical considerations of utilizing the data generated by MOOC participants.

♦The study by (Daradoumis et al., 2013) provides insights into various aspects of MOOC research, including a study on the design, delivery, and evaluation of MOOCs. It also presents a comprehensive dossier on the challenges associated with managing, delivering, and evaluating large online courses. Furthermore, the authors offer recommendations for improving MOOC design, delivery, and evaluation through the utilization of software agents.

♦The researchers (Khalil & Ebner, 2014) present study is thorough in its examination of the relevant literature. Analyze personal data and notes regarding the reasons why students withdraw from or fail MOOCs. The lack of utilization of MOOCs has been attributed to time constraints, a lack of learner motivation, a lack of community in big online courses, inadequate preparation, and unexpected costs all play a role. Consequently, several plans have been devised in order to improve the percentage of students who continue their studies online and to make it possible for more online students to graduate. (Such as facilitating students with varying schedules, fostering student success, and enhancing "student-to-student" and "student-to-coach" interaction, as well as enhancing Online learning skills). Finally, it should be noted that their research represents the initial effort to improve the retention rate and that these proposals should be adopted and assessed in the future.

♦The review was presented by researchers (Bozkurt et al., 2017) to identify research tendencies and patterns in MOOC research from 2008 to 2015. Since 2013, research on MOOCs has increased, indicating a promising direction for the coming years. A review of MOOC research areas revealed that MOOC research includes three primary areas: ideas and models, characteristics of the students being taught, and instructional design. This study indicated that Learner assistance services, administration and regulation, ethics, fairness, and accessibility are the least researched areas.

♦The analysis by the researchers (Sanchez-Gordon & Luján-Mora, 2018) found that the results of a comprehensive review of the computer from 2008 to 2016, found 40 relevant studies that were published between the years 2012 and 2016, in the field of accessible MOOCs in addition, there were determined to be eight research dimensions and 58 sub-dimensions, and the relevant studies were mapped to each of them.

♦The researchers (Dalipi et al., 2021) follow the method of a literature review using emotional analysis to evaluate comments from students in a study of MOOCs. It looks at works published between January 1, 2015, and March 4, 2021. It used PRISMA's tiered framework to guide the search. It looked for studies in six online search databases ("ACM, IEEE, ScienceDirect, Springer, Scopus, and the Web of Sciences"). From the 440 articles found in the first stage, the review found 40 that were relevant. From the literature reviewed, it was decided that the research would focus on six Domains: MOOC study materials assessment, feedback discrepancy detection, SA effectiveness, and SA Through posts on social networking sites, learning about how courses work and why people drop out and evaluating the MOOC Design Model. In the end, classifier performance can be enhanced by employing contextualized embeddings in addition to typical NLU (Natural Language Understanding) techniques such as part-of-speech, parsing, etc. to represent words.

♦(Meet & Kala, 2021) their research supports the idea that a comprehensive analysis of empirical research that has been done on MOOCs from 2013, when the MOOC movement started to gain steam, to 2020, according to COVID-19, every student and their parents were talking about MOOCs. The time frame of eight years is enough for the field of pedagogical technology, which changes quickly, grows, matures, and gives enough data to find trends and patterns. Their research uncovered a number of information gaps pertaining to MOOCs as well as potential new pathways that need to be addressed by researchers, course producers, practitioners, designers, and other stakeholders.

♦The study by (Boonroungrut et al., 2022) showed a scientific study of MOOCs research. In their review, they used distance-based network maps in VOSviewer to do bibliometric network analysis. The three major study groups were confirmed by the 3,211 eligible publications that came out between 2011 and 2020: learning systems, human characteristics, and higher education. In addition, the findings revealed that concepts such as “learning systems,” “gender inequality,” and “flipped classrooms” developed as ongoing study themes. In addition, these results indicate low rates of productivity in the Middle East

and Gulf region. Their researchers propose an alternative method for scholars to review the literature, based on the network analysis method, using a strategy that most definitely incorporates existing articles concerning MOOCs. The following table shows the previous studies conducted on MOOC

Table (2) explain a summary of previous research related to the review

Search publication date	Search name
2013	MOOCs: A Systematic Study of the Published Literature 2008-2012
2013	A review on massive e-learning (MOOC) design, delivery and assessment
2014	MOOCs Completion Rates and Possible Methods to Improve Retention - A Literature Review
2015	Quality of MOOCs: A review of literature on effectiveness and quality aspects
2017	Trends and Patterns in Massive Open Online Courses: Review and Content Analysis of Research on MOOCs (2008-2015)
2018	Research challenges in accessible MOOCs: A systematic literature review 2008-2016
2021	Trends and Future Prospects in MOOC Researches: A Systematic Literature Review 2013–2020
2022	A ten-year bibliometric network review on Massive open online courses (MOOCs) research: 2011-2020
2023	Exploring the Advancements in MOOC Studies: A 2008-2022 Overview

MOOCs SYSTEM LITERATURE

A set of previous studies have been submitted to electronic journals on the MOOC system.

♦The researchers (Lourdes Guàrdia et al., 2013) suggest specific design tenets that must be considered when developing a MOOC. These include: Approach to Design Based on Competencies, Learner Empowerment, the Learning Plan, Clearly Defined Orientations, Collaborative education, social networking, and Evaluation and peer feedback Media-technology augmented education.

♦(Lin Cui et al., 2014) observe MOOC significantly impacts the teaching and research processes. It was not difficult to foresee those massive open online courses (MOOCs) would

significantly alter the globalization of college or university. MOOCs facilitate global access to shared educational resources and make large-scale, individualized learning possible. For colleges and universities, education via MOOCs entails not just the use of innovative technology, but also substantial changes to the entire educational system, including teaching methods, personnel training, and other teaching-related factors.

♦• After the advent of open online courses (MOOCs) in 2012, the study (de Larreta-Azelain, 2015) addressed the teacher's role in MOOCs. During all phases of MOOCs, the trainer must manage and supervise all of its components. To achieve this, they must first possess expert knowledge of all applicable technology resources. Faculty members can show their leadership capabilities by recording a video presentation, as well as adding other types of activities such as learning through games and collaborative activities.

♦The study by (Gamage et al., 2015) mentioned the introduction of MOOCs has transformed attitudes toward E-Learning by giving it a new focus. As a result, the dimensions of effectiveness and elements discovered before the launch of the MOOC need to be revised to meet the new requirements of E-Learning in the MOOC. At the same time, many MOOCs have been launched into the market, which may lead to a potential quality issue since not all MOOCs can achieve the desired results. Users need to evaluate the effectiveness of MOOCs.

♦The research conducted by (Lee et al., 2016) proposed that the MOOC design model must be constructed so that it can provide precise recommendations on design activities while taking into account the MOOC's unique qualities. The MOOC design model, for example, was created in two stages. After conducting a thorough literature analysis, the components of MOOC design were compiled into one model. Second, an expert review and a validity evaluation were used to revise the study. There is a need to distinguish between the responsibilities of teachers and course designers involved in the design and implementation of MOOCs.

♦(CONACHE et al., 2016) research confirms the notion most significant advantage of MOOCs is that participants can study anywhere they want, whenever they want, and at their own pace. Tests, quizzes, and assessments may have due dates associated with them, but it is up to the student to decide when they will be taken. MOOCs, much like more traditional forms of education, foster student collaboration through online forums and discussion groups. They can employ social networking to assist one another in comprehending the topic and the tasks and obtain an instant response from the teachers.

♦According to (Chatwattana & Nilsook, 2017) an online educational platform can be divided into three parts: 1) the student system, 2) the lecturer system, and 3) the management system. The admin system is responsible for setting permissions for users, courses, principals, and user groups. It is up to the student to study the material presented in the lesson, complete any online tests, participate in any educational activities, and work on any projects that are assigned. The responsibility for managing the learning system rests with the lecturer. This includes, but is not limited to, Lesson Editing (Adding and Editing Contents, Adding and Editing Documents, Adding and Editing Worksheets), Learner Management (Adding, Deleting, and Editing Learners, Adding and Editing Project Scores and Learner Behavior), Exam Management (Adding, Editing, and Deleting Exams), etc.

♦(Zhu & Bonk, 2019) stated their research followed a mixed-methods strategy to evaluate instructors' perspectives on self-directed learning (SDL), as well as the design of MOOCs to encourage student SDL. MOOC instructors motivated students by making available high-quality resources, assisting them in the process of setting learning goals, ensuring that the course was accessible, designing short learning units, providing feedback, leading meaningful activities, and offering opportunities for social learning. The use of quizzes, feedback, and self-reflection was incorporated into the classroom to facilitate student self-monitoring. The provision of flexibility and support, the transmission of

reminder messages, and the suggestion of expected timescales were among the strategies proposed to facilitate student management.

♦The findings reported by (Mahajan et al., 2019) indicate that MOOCs provide a platform that enables students to seek instruction from well-known professors at a variety of colleges located all over the world, which is ultimately beneficial for the students. Learning through distance education is the incarnation of traditional learning in all its varied elements, including the distribution of a large quantity of information and knowledge to the students. As more people turn to the internet and engage in activities there, online education has emerged as a dominant force, creating the ideal conditions for the launch of massive open online courses (MOOC).

♦(Yuniwati et al., 2020) establish a method of evaluation to determine the level of excellence of the MOOC platform. When developing the evaluation tools, it is necessary to conduct validity and reliability tests. Their research has two types of validity; one comes from experts, and the other comes from students. In addition, there are three reliability tests, each of which has a value of 0.624 according to Cronbach's Alpha.

♦The researchers (Shah et al., 2021) discussed that Massive Open Online Courses (MOOCs) have made education more accessible to everyone worldwide than ever before. MOOCs, are courses offered on-demand by well-known colleges around the world, making education accessible to the general public. To make higher education more accessible to the masses of people who want it, organizations like edX, Coursera, Future Learning, Udacity, and others act as course aggregators. Students from a wide range of backgrounds can participate in MOOCs and learn from each other. Traditional classroom settings, such as exorbitant prices, credit requirements, access restrictions, and limited enrolment capacity, are overcome by this method.

♦(Pinanta Chatwattana, 2021) proposed uses a mixed-methodological investigation of how educators see SDL and how online courses like MOOCs might most effectively promote it. Setting learning goals, making sure the course was accessible, structuring short learning units with feedback, and conducting meaningful activities were all ways in which MOOC instructors encouraged their students to learn. Self-reflection, feedback, and quizzes were used in the classroom to encourage self-monitoring. Students could be better managed by providing them with more flexibility and help, sending them reminders, and letting them know when things will be finished.

♦(Zhu, 2021) explains the concept of self-directed learning (SDL) is becoming increasingly important in today's educational landscape, particularly in massive open online courses (MOOCs). Learning through MOOCs can be difficult due to the shift in power from the instructor to the student. Learners who are not provided with adequate direction from MOOC instructors run the risk of becoming disoriented and experiencing feelings of being overloaded cognitively. Therefore, the facilitation that teachers provide helps learners enhance their SDL skills. The instructors of MOOCs suggested that one way to assist students in self-management is to set learning goals, provide flexible schedules, create equal conversation, send reminders, as well as provide educational materials, a few short lessons, an acceptable workload, and an organized structure within the MOOC.

♦According to the study by (Tao et al., 2022) with MOOCs, users can experience a variety of unique learning experiences, such as information search, interface navigation, and self-control of the educational process. They can also communicate and collaborate with other members of the MOOC and take examinations online. As a result, the quality of MOOCs may be judged differently from that of traditional classroom learning by the students themselves.

♦(Zhu, 2022) suggested adult education relies heavily on self-directed learning, or SDL for short, particularly when it comes to achieving success in MOOCs. Learners do not

automatically possess the SDL skills and abilities; therefore, they anticipate receiving direction and assistance when they begin their studies. As a result, learners need the facilitation and aid of instructors to develop their SDL skills, and this support may be broken down into three interwoven elements: (1) behavioral control, (2) behavioral awareness, and (3) motivation. The consequences of cognitive learning are influenced by the level of motivation of the learner. Important in the context of massive open online courses are characteristics such as motivation and self-discipline among students (MOOCs). Consequently, teachers must motivate students enrolled in MOOCs.

♦The researchers (Jiang et al., 2023) observe Massive open online course (MOOC) has become widespread in recent decades for online tutoring and self-study by providing multiple course resources, intermediate feedback, and student-instructor interactions. The evaluation of MOOC course quality is one of the most important responsibilities in MOOC platform management, as it contributes to the improvement of course contents, the promotion of student learning efficiency, and the enhancement of user services (e.g., course suggestion and cognitive diagnosis). it observes that within the platform for MOOCs, in addition to the student and the course, there exist multiple types of entities and multiple forms of relationships between pairs of distinct entities. The intricate MOOC data structures are consistently shown in the form of heterogeneous information networks known as MOOC HINs.

CONCLUSION

With the rapid development of digital technology and the COVID-19 pandemic scenario, many of the world's most prestigious academic systems have begun offering their very own massive open online courses (MOOCs). In addition to supplementing their education received on-campus, massive open online courses (MOOCs) have the ability to improve both learning and instruction by providing an adaptable educational technology platform. This paper provides a comprehensive review of previous studies conducted on MOOCs and clarifies the focus of each study. In addition, it provides an analysis of the MOOC system's components and functions based on previously published research and articles. This paper's strongest points are its comprehensive systematic literature assessment and long-time frame of coverage (from 2008 to 2022).

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